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ABSTRACT

This paper describes a World Wide Web-enhanced graduate course at the University of Memphis (Tennessee) called "IT [Information Technology] Trends and Issues in Higher and Adult Education." Topics covered include the course objectives, technology used, course activities, and assignments. Four prevalent learning styles are summarized (i.e., the converger, assimilator, diverger, and accommodator), and seven principles for good practice in education are listed. The paper then presents results of a survey that evaluated participants' responses to the methodology and pedagogy used in the course. Results show that the ten students had a positive learning experience utilizing technology and that most students had the skills and computer access necessary to complete the course. Critical success factors for the Web-enabled course are summarized in three categories: IT infrastructure, instructor design and intent, and student openness to new approaches. (MES)

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A Web-Enabled Graduate Course: Two Perspectives

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Abstract

Web-enabled graduate courses allow adult students to choose and utilize powerful new technologies which will enrich their learning experience. Such technologies allow students to use hardware, software and the Internet to positively impact each student's unique learning experience. Instructional technology becomes an enabling force to transform higher education by enhancing student learning when effectively used by IT fluent faculty. We know that the future of higher education will be dramatically different than it is today. And, we know that one way we can impact graduate students at this time is through an enriched curriculum that demonstrates the best practices in education, meets the variety of learning styles of students, enables individual exploration and discernment, and stimulates intrinsic motivation.

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A Web-Enabled Graduate Course: Two Perspectives

Introduction

Stanley Katz, Director of Princeton's Center for Arts and Cultural Policy Studies suggested at the Forum for the Future of Higher Education, "we need to be very careful to ensure that information technology serves the university, and not the other way around . . . we have reacted to technology, rather than thinking creatively about how it might enrich our basic educational mission . . . we have confused a tool with a goal" (Katz, S. 2001). This statement reflects two very significant perspectives. First, too often information technology has been served by the university rather than serving it-a statement that we believe to be true. Secondly, IT is only a "tool"-which we do not believe to be the case.

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We believe that instructional technology utilized by IT fluent faculty can effectively transform higher education by changing what happens in the classroom thus enhancing student learning. We know that the future of higher education will be dramatically different than it is today. Yet, we know that one way we can impact students at this time is through an enriched curriculum that meets the special needs of adult graduate students.

Web-enabled graduate courses allow adult students to choose technological options which might enrich their individual learning experience. Wlodkowski (1999) suggests for adult learners to experience intrinsic motivation to learn, they need to connect who they are with what they learn; they need to experience choice and success in the learning activities. Kolb (1982) suggested that "motivation to learn may well be a result of learning climates that match learning styles and thereby produce successful learning experiences" (p. 248). Web-enabled courses which include PowerPoint presentations that are integrated with a course management system to replace the traditional lecture provide ubiquitous access to lecture notes, reference materials, and expedite communication and dialogue between the instructor and course participants. Such new methodologies and technologies rely on instructor adaptation and student choice and self-direction. Thus, this course structure allows adult students to choose from a variety of options for different student learning styles which will enrich each individual student's educational experience, increase student motivation to learn, and enhance the individual's learning and understanding.

Furthermore, we believe that web-enabled courses allow the instructors to cultivate the best practices to promote student learning. Although Chickering and Gamson developed their Seven Principles for Good Practice for undergraduate students, we feel they provide benchmarks for excellence in graduate education.

Rationale for Course and Course Activities

The course "IT Trends and Issues in Higher and Adult Education" was developed to prepare future and current administrators with a broad-based understanding of key information technology issues on college and university campuses. A course objective is that all students leave the course with a basic understanding of information technology fluency concepts and have acquired skills to enhance their fluency. The course utilizes many of the information technology capabilities available to instructors and students at The University of Memphis. The course is taught in a smart classroom where the instructor and each student have a personal computer and access to all technological devices of a smart classroom and the World Wide Web. All PowerPoint presentations with full lecture notes attached are provided online to the students prior to the class and students are expected to have studied the lecture notes and completed assigned readings to enable engaged discussion and dialogue during class. CourseInfo was used as the course management system providing access to student web pages, private group work space, e-mail, discussion board, chat, cumulative grades, assignments, syllabus, and external links to pertinent information and extensive references. The course is taught in the extended summer session which meets every other week for five weekends. Expert guest speakers and field trips to the main computer center, the telecommunications hub, and technological training rooms augment the learning experience for the students. All course activities focus on information technology as an enabling force different than any we have seen before. Students are required to complete the following assignments

which must be submitted via the Internet using the course management system, CourseInfo.

" find articles concerning information technology issues related to higher education from an electronic source, summarize them and be prepared to lead a discussion about the topic

" write a term paper on a higher education topic of interest to the student and approved by the instructor that includes hot linked footnotes to digital sources from the WWW

" develop a technology related project that is meaningful to the student and prepare a demonstration of the outcome for class

" participate in a summer long group case study which serves as a final examination that includes a written report and PowerPoint presentation to the class

Adult Learning

There is no universally accepted, comprehensive, definitive theory of adult learning yet according to Knowles' concept of andragogy, adult learning helps inform educators that develop curriculum for adult students. Knowles (1980) suggests:

" An adult's self concept moves from that of a dependent personality to being a self directed human being

" Adults have a great deal of experience which enriches learning

" Adults seek relevance from learning experiences - they are more problem centered than subject centered in learning

" Adults are motivated to learn from internal factors not external factors

Thus, students in the doctoral program in higher and adult education come to class as a requirement for graduation and with a desire to learn something that they will be able to use immediately to help them be successful in future work or in current work situations. Many are mature individuals who have years of work experience to use to enhance what is presented in class. They know how they like to learn, they are intrinsically motivated, and they are self-directed, able to fill in the gaps when the educational experience does not fit their preferred learning style.

A web-enabled course provides the students with a plethora of ways to learn. Consequently, students are able to be intrinsically motivated to learn, "to be curious, to be active, to initiate thought and behavior, to make meaning from experience, and to be effective at what they value" (Wlodkowski, 1999, p. 7). In addition, "motivated learners care more and concentrate better while they expend that effort, and they are more cooperative" (p. 6). Thus, the methodology should enhance the pedagogy providing the students with an enriched learning experience.

Student Learning Styles

David Kolb (1982) suggests "Continuous lifelong learning requires learning how to learn, and this involves appreciation of and competence in diverse approaches to creating, manipulating, and communicating knowledge" (p. 252). Kolb identified four prevalent learning styles. They are the Converger, the Assismilator, the Diverger, and the Accommodator. Each learning style has dominant learning abilities and resulting needs for a good educational experience (Murrell, P. & Claxton, C., 2001).

Convergers' dominant learning abilities are abstract conceptualization and active experimentation. They prefer learning situations where there is one correct answer and they prefer to work with things rather than people. Given these preferences, convergers

enjoy lectures and programmed instruction such as the PowerPoint slides and the lecture notes being online. They also would enjoy the field trips, lectures by experts, developing the project of their choice, researching a term paper, and the problem solving involved in the final group based case study.

Divergers' dominant learning abilities are concrete experience and reflective observation. Their greatest strength lies in their imaginative ability and their ability to view concrete experiences from a variety of perspectives. They enjoy brainstorming exercises and activities that involve people and emotions. Class activities that are concrete experiences include: the guest speakers, the field trip, case studies, dialogue about the lecture notes, and student's association of work related activities to the topic of the session. Students are able to engage in reflective observation in developing the article summaries where they can reflect on what they have learned and group activities such as the final case study where they have an opportunity to discuss class sessions with class mates.

Assimilators' dominant learning abilities include abstract conceptualization and reflective observation. They enjoy inductive reasoning and fixing disparate observations into an integrated explanation. They are less interested in people than in abstract concepts. It is more important that a theory be logically sound and precise than practical. Class activities such as PowerPoint slides online, dialogue and inquiry about the lecture notes, and the technical aspects of being introduced to new instructional technology will appeal to the assimilators in class. They will also enjoy the reflection and observing involved in the article summaries and group work where they get to make connections with other classmates and discuss topics covered in class.

Accommodators are best at concrete experience and active experimentation. They are risk takers and enjoy carrying out plans and trying new ways of doing things. They are intuitive and rely on people for information rather than their own analytical ability. They rely on facts rather than theory. Given these preferences, accommodators will enjoy the expert lectures, the field trips; the group based case study final as well as developing the project of their choice, researching a term paper, and problem solving related to new experiences on the Internet and with smart classroom technologies.

The ten students from the class on which this paper is based likely represent most or all of the four learning styles. A look at the course plan indicates that there will be learning activities that appeal to all of the learning styles. It is important to note that the students are required to complete certain assignments, yet the web-enabled course presents relevant important material while offering choices and encouraging self-direction in meeting the class objectives.

Seven Principles for Good Practice

As Chickering and Ehrmann (1994) note, technology can advance the Seven Principles for Good Practice in Education. They suggest and we demonstrate:

1. Good practice encourages contacts between students and faculty - Electronic mail, computer conferencing, and web-enabled courseware increase opportunities for students and faculty to converse and exchange work in a faster, easier way than previously experienced. Students are less inhibited to share concerns and controversial ideas by utilizing the tools of information technology.
2. Good practice develops reciprocity and cooperation among students - Group projects, collaborative learning, and group problem solving are enabled and strengthened

through the use of the communication tools of electronic mail and web-enabled courseware. Students relied on the courseware and e-mail to develop the case study final examination and presentation. Some students traveled a distance to get to the University of Memphis campus and the use of the technology enabled them to participate in group work and not leave their homes.

3. Good practice uses active learning. - The development of the technology project gave students the opportunity to develop a skill that would help them in their work or course work. Students came to the class with a variety of competencies. Some learned to create a PowerPoint presentation, others learned how to utilize the relational database Access, some created web-pages, one put a course online utilizing Courseinfo, and one learned to use software to teach students how to play the piano. Each learned a skill appropriate for their needs but each was actively involved in the learning experience.

4. Good practice emphasizes time on task - Use of technology enables students to study more efficiently utilizing well organized course management systems that are readily linked to appropriate references. Also, use of technology enables students' access to course materials and reference materials without the commute, i.e., over 14,000 electronic library books, a variety of online bibliographies, and the vast resources of the Web.

5. Good practice gives prompt feedback - Students had easy access to grades through CourseInfo and had quick access to the instructor for guidance and discussion through electronic mail.

6. Good practice communicates high expectations - Expect more and you get it. This idea was prominent in the course. Many students came to the class with little computer literacy but left the class with fluency.

7. Good practice respects diverse talents and ways of learning - The variety of resources presented in the class enabled students to access information through print, the web, powerful visuals, guest speakers, actual experiences, collaboration, active learning opportunities, lecture, group problem solving activities, and individual reflection.

Technology and Higher Education

Weigel (2002) suggests ". . . Technology in higher education should enrich and extend the student's exploration of new territory" (p.xiii). He goes on to explain that learning should involve a search for new knowledge that is related to "the activities of play, discovery, and problem-solving" (p.3). Privateer (1999) suggests that higher education carve out a different strategic path that utilizes instructional technology to "reengineer and reinvent curriculum," one that fosters learning as collaboration, discovery, and problem-based cognition. This graduate course was developed to meet adult student needs and expectations for ease in course delivery and to provide ubiquitous accessibility to course materials. We believe that the outcomes of the course exceeded the objectives because the students also experienced collaboration, discovery, and learned through the use instructional technology that expedited the problem-based curriculum design.

Survey Findings

The Graduate Student Perspective

MTSU's Instructional Technology Survey was modified to collect course participants' responses to the methodology and pedagogy used in the course. All ten of the students who completed the course responded to the survey. All of the students are enrolled in the Masters/Doctoral Program in Higher and Adult Education at The University of Memphis.

The average age of the participants was 42 with varied educational backgrounds including music, communications, education, landscape architecture, biology, and business administration. Six men and four women completed the course and survey.

The findings are summarized in the following table.

Survey Questions 1- 13: 1- Strongly Disagree, 2 - Disagree, 3 - Neither agree or disagree, 4 - Agree, 5 - Strongly Agree Mean

1) I believe that the use of technology in the classroom can enhance student learning. 4.5

2) I believe that the use of technology in the classroom enhances student learning in my major. 4.0

3) I believe that e-mail communication is an important tool in instructor/student communications. 4.7

4) I believe that web-based instructional materials can enhance student learning. 4.1

5) I have adequate access to computer technology for my educational use. 4.3

6) It is important that U. of Memphis Technology Access Fees are used to provide smart classrooms to facilitate the use of instructional technology. 4.1

7) It is important that U. of Memphis Technology Access Fees are used to provide computers, labs, and resource centers for students for educational use. 4.7

8) I had the skills and knowledge required to use basic computer applications. 4.4

9) I did not have the skills and knowledge required to use basic computer applications, but I acquired the basic skills in class. 2.1

10) I had the skills and knowledge required to communicate electronically. 4.2

11) I did not have the skills and knowledge required to communicate electronically, but I acquired those skills in class. 2

12) I had the knowledge and skills required to use web-based instructional materials. 3.8

13) I did not have the knowledge and skills required to use web-based instructional materials, I acquired those skills in class. 2.2

14) Number of classes that you have taken in a smart classroom. 1.7

15) How did your instructor's use of Courseinfo applications to present lecture outlines affect your overall learning experience? 1- positively 2 - not at all 3 - negatively 1.3

16) How does electronic communication with your instructors and other students affect your overall learning experience? 1 - positively 2 - not at all 3 - negatively 1.4

17) How does your use of supplementary materials such as web pages or computer based applications affect your overall learning experience? 1 - positively 2 - not at all 3 - negatively 1.1

18) How did your use of Courseinfo to complete assignments, review presentations, and submit coursework affect your overall learning experience? 1 - positively 2 - not at all 3 - negatively 1.2

How likely are you to do the following in the next 18-24 months?

1 - Very Unlikely, 2 - Unlikely, 3 Neither likely or unlikely, 4 - Likely, 5 - Very Likely

19) Communication electronically with your instructors or use electronic mail, listserv, or discussion groups 4.9

20) Use supplementary educational materials such as web page and other computer based applications. 4.6

21) Use a computer to complete assignments, create presentations, or web pages. 4.8

The results of the survey show that the ten students in the course had a positive learning experience utilizing technology. Also, most of the students had the skills and computer access necessary to complete the course. Two students had to learn how to use the technology as they progressed through the class. It is interesting to note that these two students did not rate their learning experience as positively as those who had the skills and ready access to a computer. All of the students but one suggested that use of technology in the classroom was a positive experience and that it was an experience they considered essential to meet the demands of their current or future work in education. They also said that the course requirements enabled them to learn new skills and utilize new technology.

The Instructor Perspective

The UoM class evaluations reflected similar results. The evaluation form consisted of 20 questions in five categories. Lower mean scores generally indicate positive responses. In "Instructor Involvement" (expressed enthusiasm, interest in topic, personal experience, and concern for student learning) the class mean was 1.27 (on a five point scale) compared to departmental, college, and institutional means of 1.29, 1.38, and 1.55 respectively. The "Student Interest" (in learning, attentiveness, course challenge, and competence gained) mean was 1.30 compared to 1.35, 1.51, and 1.68. The mean for "Instructor Interaction" (engaged students to express opinions, receptive to new student ideas, opportunity for questions, and stimulated discussion) was 1.32 compared to 1.26, 1.48, and 1.69. The "Course Demands" (amount of material covered, pace of delivery, amount of homework, and difficulty of readings-all indicating difficulty of the course) mean was 3.30 versus 4.04, 3.84, and 3.62. Finally, the "Course Organization" (concepts related systematically, well organized, logical content units, and direction adequately outlined) mean was 1.20 compared to 1.36, 1.62, and 1.73. The mean response to the capstone question "This course made a significant contribution to your overall personal educational objective" was 1.27 versus 1.35, 1.66, and 1.93. In summary, the course was considered much more difficult than other courses but in almost every comparison was rated higher by the students.

Critical Success Factors

The success of the web-enabled graduate course described in this paper depends upon differing factors that we choose to summarize into the categories of: IT infrastructure, instructor design and intent, and student openness to new approaches.

Infrastructure:

1. The university must have an adequate IT infrastructure that supports high speed connections from the Internet to the individual desktop and a web based access point to the course management system.
2. A course management system which enables a single interface for student access to a variety of options which facilitate learning is needed.
3. Access to electronically available digital library resources is considered necessary.
4. A smart classroom which supports Internet access, a smart board, individual computers, video projection capabilities, etc. is advantageous.
5. Access to technology support personnel and a widely available Help Desk facility are needed.

Design and Intent:

1. The instructor needs to recognize that the course must be designed from the ground up; it is not an existing course which will be "modified."
2. The course make-up and content needs to focus on the art of thinking and exploration.
3. The course needs to encourage the use of skills and knowledge in a variety of contexts enabling students to extract general principles from their experiences of learning by doing.
4. The instructor needs to engage in a variety of activities enhanced by the smart classroom that facilitate student learning. These include:

" Modeling-helping students learn to think by problem solving and critical analysis.
" Coaching-observing, offering feedback and asking questions.
" Scaffolding-by providing hints and help in performing technological tasks and by building in opportunities for student-to-student modeling and coaching.
" Articulating-allowing students to practice their skills in converting tacit knowledge to explicit knowledge.
" Reflecting-providing for the process of reflection encouraged by students and the instructor.
" Exploring-encouraging students to tackle new knowledge domains and problems on their own. (Weigel, pp. 9-11)

Student Openness:

1. Many adult students come into the class with little or no experience in such a course. Even with a self appraisal of adequate computing skills they must learn to use and experiment with newly presented technologies in ways different from past exercises. An inability to adapt would result in great difficulty.
2. Almost all students have little or no academic experience in group-based projects where the grade is based on the group performance rather than individual performance. The competitiveness and blame sometimes encountered must be overcome.
3. Such a course requires hard work and focused study on many new concepts. Students looking for an easy grade would probably not do well.

Conclusions

Generalizations cannot be drawn from this single experience but we set forth the following suppositions to be tested by others. Web-enabled graduate courses allow adult students to choose from a variety of options which will enrich their learning experience. Such courses allow students to use the instructional technology to positively impact each student's learning experience. Instructional technology can effectively impact higher education if used in a transformative way to enhance student learning. We know that the future of higher education will be dramatically different than it is today. And, we believe that one way faculty can impact students at this time is through a technology enriched curriculum that demonstrates the best practices in education, meets the variety of learning styles of students, and promotes intrinsic motivation to learn for graduate students.

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